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10/672,700	09/25/2003	Eduard K. de Jong	SUN040023	9228

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EXAMINER
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SHAN, APRIL YING

ART UNIT	PAPER NUMBER
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2135

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/20/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/672,700

Applicant(s)

DE JONG, EDUARD K.

Examiner

April Y. Shan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-63 is/are pending in the application.
- 4a) Of the above claim(s) 8-15, 23-30, 38-45 and 53-63 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 16-22, 31-37 and 46-52 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 12/15/2003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. Claims 1-7, 16-22, 31-37 and 46-52 have been examined.

#### *Election/Restrictions*

2. Applicant's election with traverse of Group I (claims 1-7, 16-22, 31-37 and 46-52) in the reply filed on 25 January 2007 is acknowledged. The traversal is on the ground(s) that subcombination characterization in the action is incorrect and failed to recognize the proper relationship between the claims.

This is not found persuasive because:

On page 2 of the Applicant's argument, the Applicant argues "The Group II claims are directed at a method for making such an obfuscated application program" and on page 3 of the Applicant's argument, the Applicant argues, "The group II claims recited a method of making such an encoded opcode and group III claims at the product. Thus the subcombination characterization in the action is incorrect...which is required by the Rules...product, process of making, and process of using...".

The examiner respectfully responds that, group II claims recite a method of **"creating an opcode value encoding scheme"** (Please see pages 69, 73, 77 and 80 of the original claims). Thus, contrary to the Applicant's argument, Group II claims are **not** a method of making such an encoded opcode and **not** a method of method for making such an obfuscated application program.

Additionally, the examiner respectfully points out, group III claims recite a memory storing a data structure, which **includes information used by** the application program execute an obfuscated application program (Please see page 82 of the original

claims). Therefore, contrary to the Applicant's argument, Group II claims are **not** a product.

Therefore, the process of making and product are not presented in the Group II and Group III claims as the Applicant argues. The subcombination characterization in the action is correct and claims 8-15, 23-30, 38-45, 53-60 and 61-63 are withdrawn from consideration.

The requirement is still deemed proper and is therefore made FINAL.

### ***Drawings***

3. The drawings are objected to: For example, as failing to comply with 37 CFR 1.84(p)(4) because reference characters "218" has been used to designate both "numeric keyboard" and "alphanumeric keyboard" (fig. 2); reference character "485" has been used to designate both "obfuscation descriptor" and "virtual machine" (fig. 4); etc. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to as failing to: For example, comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 115, 120, 140 (fig. 1); 325, 330, 335, 340, 370 (fig. 3); 510 (fig. 5B), etc. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

**5. This is not intended to be a complete list of objections to the drawings. Applicant is required to review and correct the drawings to place them in compliance.**

#### ***Specification***

6. The disclosure is objected to because of the following informalities: the reference to application numbers provided in page 2 needs to be updated to reflect applications that have matured into patents. Appropriate correction is required.

7. The disclosure is objected to because of the following informalities: "ATM" (page 18). These terms have not been defined. Appropriate correction is required.

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8. The disclosure is objected to because of on page 18, paragraph [0015], "The process can be implemented as instructions executed by such hardware, hardware alone, or any combination thereof. The software...readable by a machine". It appears to the examiner that the sentence is contradicted to itself. If only hardware alone, where is any combination thereof. The examiner assumes the Applicant meant "The process can be implemented as instructions executed by such software, hardware alone, or any combination thereof...." Appropriate correction is required.

***Claim Rejections - 35 USC § 101***

9. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. Claims 31-37 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

**Claims 31-37** contain "means-plus function" limitations and appear to be systems. However, it is noted on page 18, paragraph [0015], the apparatus can be software alone. Therefore, these claim limitations can be reasonably interpreted as software per se. The claims are directed to systems of functional descriptive material per se, and hence non-statutory.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1-2, 4, 16-17, 19, 31-32, 34 and 46-47, 49 are rejected under 35 U.S.C. 102(e) as being anticipated by Zeman et al. (U.S. Pub. No. 2004/0003264).

As per **claims 1 and 31**, Zeman et al. discloses a method/apparatus for executing an obfuscated application program, the method/apparatus comprising:

receiving an obfuscated application program, said obfuscated application program comprising at least one instruction opcode value encoded using one of a plurality of instruction set opcode value encoding schemes ("Sometime before an obfuscated function is called, it must be deobfuscated..." – e.g. par. [0082], "At step 902, the deobfuscation process is triggered. Deobfuscation is triggered at some point in time before the function is called" – e.g. par. [0083], par. [0073]- [0077] and Fig. 8);

determining a dispatch table associated with said application program, said dispatch table corresponding to said one of a plurality of instruction set

opcode value encoding schemes ("The original bytes, and their offsets into the function, are saved in a table so that the function can later be "de-obfuscated" by restoring they bytes to their original values" – e.g. par. [0006], "At step 810, a healing table (e.g., healing table 600, shown in Fig. 6) is created to aid in the deobfuscation of code prior to its execution...At step 812, the healing table is added to the executable..." – e.g. par. [0078] – [0079]); and

executing said application program using said associated dispatch table ("The deobfuscation routine consults the table and restores the replaced bytes in the function to their original values" – e.g. par. [0008] , "...This pre-obfuscation value is determined, preferably, by looking up the value on healing table 600...At some subsequent point, the function is called (step 912), and execution of the function proceeds (step 914) – e.g. par. [0084] and fig. 9. Please note healing table 600 corresponds to Applicant's dispatch table).

As per **claims 2 and 32**, Zeman et al. discloses a method/apparatus as applied above in claims 1 and 31 above. Zeman et al. further discloses wherein said determining comprises generating said dispatch table in response to said receiving ("While step 810 is shown below step 808 in Fig. 8, it should be noted that the healing table does not have to be created subsequent to the replacement of bytes in the original code. In fact, the healing table is preferably created while the bytes are being replaced).



As per **claims 16-17**, Zeman et al. discloses the claimed method of steps as applied above in claims 1-2. Therefore, Zeman et al. discloses the claimed program of instructions embodied in a program storage device for carrying out the method of steps.

As per **claims 46-47**, they are rejected using the same rationale as rejecting claims 31-32 above.

As per **claims 4 and 34**, Zeman et al. discloses a method/apparatus for executing an obfuscated application program, the method/apparatus comprising:

receiving an obfuscated application program, said obfuscated application program comprising at least one instruction opcode value encoded using one of a plurality of non-standard instruction set opcode value encoding schemes ("In a preferred embodiment, healing table 600 is stored...in a "scrambled" form....For example, healing table 600 can be XOR'd with a known value. This XOR technique allows the content of healing table 600 to be recovered easily, while making its presence within executable 10(1) somewhat more obscure that it would be if healing table 600 were stored in the clear" – e.g. par. [0071] and fig. 7. Please note "scrambled" healing table corresponds to Applicant's non-standard instruction set opcode value);

determining an instruction set opcode value encoding scheme associated with said obfuscated application program ("The original bytes, and their offsets into the function, are saved in a table so that the function can later be "de-obfuscated" by restoring they bytes to their original values" – e.g. par. [0006], "At step

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810, a healing table (e.g., healing table 600, shown in Fig. 6) is created to aid in the deobfuscation of code prior to its execution...At step 812, the healing table is added to the executable..." – e.g. par. [0078] – [0079]);

rewriting said application program using a standard opcode value encoding scheme if said received application program is not encoded using said standard opcode value encoding scheme ("An example of an executable rewritten according to step 812 is discussed above in connection with Fig. 7" – e.g. par. [0079]; and

executing said application program using a dispatch table associated with said standard opcode value encoding scheme ("The deobfuscation routine consults the table and restores the replaced bytes in the function to their original values" – e.g. par. [0008], "...This pre-obfuscation value is determined, preferably, by looking up the value on healing table 600...At some subsequent point, the function is called (step 912), and execution of the function proceeds (step 914) – e.g. par. [0084] and fig. 9. Please note healing table 600 corresponds to Applicant's dispatch table).

As per **claim 19**, Zeman et al. discloses the claimed method of steps as applied above in claim 4. Therefore, Zeman et al. discloses the claimed program of instructions embodied in a program storage device for carrying out the method of steps.

As per **claim 49**, it is rejected using the same rationale as rejecting claim 34 above.

13. Claims 5-6, 20-21, 35-36 and 50-51 are rejected under 35 U.S.C. 102(e) as being anticipated by Kiddy (U.S. Patent No. 6,694,435)

As per **claims 5 and 35**, Granger et al. discloses a method/apparatus for application program obfuscation, the method/apparatus comprising:

reading an application program comprising code (e.g. col. 5, lines 5-25);

transforming said application program code into transformed application program code that uses one of a plurality of opcode value encoding schemes of a dispatch table associated with said application program (e.g. col. 5, lines 45-67 and col. 6, lines 1-47); and

sending said transformed application program code (e.g. col. 7, lines 13-30).

As per **claims 6 and 36**, Kiddy discloses a method/apparatus as applied above in claims 5 and 35. Kiddy further discloses comprising receiving an application program request from a user device, said transforming occurring in response to said receiving (e.g. col. 6, lines 15-65 and col. 7, lines 13-30).

As per **claims 20-21**, Kiddy discloses the claimed method of steps as applied above in claims 5-6. Therefore, Kiddy discloses the claimed program of instructions embodied in a program storage device for carrying out the method of steps.

As per **claims 50-51**, they are rejected using the same rationale as rejecting claims 35-36 above.

***Claim Rejections - 35 USC § 103***

14. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claims 3, 18, 33 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeman et al (U.S. Pub. No. 2004/0003264).

As per **claims 3 and 33**, Zeman et al. discloses a method/apparatus as applied above in claims 1 and 31 above. Zeman et al. does not expressly disclose wherein said determining comprises selecting a dispatch table from a plurality of dispatch tables in response to said receiving, said plurality of dispatch tables stored in a memory.

The examiner takes official notice that selecting a table from a plurality of tables is common knowledge in the art at the time of the invention.

It would have been obvious to a person with ordinary skill in the art at the time of the invention to combine the above common knowledge into Zeman et al.'s method/apparatus.

The motivation of doing so would have been to select the right table in order to "consults the table and restores the replaced bytes in the function to their original values" since "the table contains the original byte values", as disclosed by Zeman et al. (par. [0008])

As per **claims 18**, Zeman et al. discloses the claimed method of steps as applied above in claims 3. Therefore, Zeman et al. discloses the claimed program of instructions embodied in a program storage device for carrying out the method of steps.

As per **claims 48**, it is rejected using the same rationale as rejecting claim 33 above.

17. Claims 7, 22, 37 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kiddy as applied to claims 5 and 35 above, and further in view of Drake (U.S. Patent No. 6,006,328).

As per **claims 7 and 37**, Kiddy discloses a method/apparatus as applied above in claims 5 and 35. Kiddy does not expressly disclose using encryption.

However, Drake discloses after said creating, applying a cryptographic process to said obfuscated application program together with a cryptographic key to create an

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encrypted obfuscated application program; and said sending comprises sending said encrypted obfuscated application program (e.g. fig. 6, col. 4, lines 40-67, col. 5, lines 1-35, col. 16, lines 1-67).

It would have been obvious to one with ordinary skill in the art at the time of the invention to incorporate encryption with the method/apparatus of Kiddy.

The motivation of doing so would have been to provide further security to the application (Drake, summary).

As per **claim 22**, Kiddy-Drake disclose the claimed method of steps as applied above in claim 7. Therefore, Kiddy-Drake disclose the claimed program of instructions embodied in a program storage device for carrying out the method of steps.

As per **claim 52**, it is rejected using the same rationale as rejecting claim 37 above.

### ***Double Patenting***

18. Claims 1-7, 16-22, 31-37 and 46-52 are provisionally rejected under the judicially created doctrine of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-48 of copending Application No. 10/672,183. Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject matter claimed in the instant application is also claimed in the referenced copending application.

19. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

20. The subject matter claimed in the instant application is fully claimed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows:

The instant application claims a method for executing an obfuscated application program, the method comprising: receiving an obfuscated application program, said obfuscated application program comprising at least one instruction opcode value encoded using one of a plurality of instruction set opcode value encoding schemes; determining a dispatch table associated with said application program, said dispatch table corresponding to said one of a plurality of instruction set opcode value encoding schemes; and executing said application program using said associated dispatch table (Claim 1).

The copending application claims a method for executing an obfuscated application program, the method comprising: receiving an obfuscated application program, said obfuscated application program comprising at least one instruction opcode value encoded using one of a plurality of instruction set opcode value encoding schemes; receiving an application program instruction corresponding to a current instruction counter value; selecting an instruction dispatch table based at least in part on said current instruction counter value; and executing said application program instruction using said selected instruction dispatch table (Claim 1).

21. Claims 1-7, 16-22, 31-37 and 46-52 of the instant application are envisioned by copending Application No. 10/672,183's claims 1-48 in that claims 1-48 of the

compending application contain all the limitations of claims 1-7, 16-22, 31-37 and 46-52 of the instant application therefore are not patently distinct from the compending application claims and as such are unpatentable for obvious-type double patenting because it would have been obvious to do the obfuscation in compending application conditional to some event and/or using a table to select/permute instructions.

22. Claims 1-7, 16-22, 31-37 and 46-52 are provisionally rejected under the judicially created doctrine of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-52 of compending Application No. 10/673,021. Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject matter claimed in the instant application is also claimed in the referenced compending application.

23. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

24. The subject matter claimed in the instant application is fully claimed in the referenced compending application and would be covered by any patent granted on that compending application since the referenced compending application and the instant application are claiming common subject matter

25. Claims 1-7, 16-22, 31-37 and 46-52 of the instant application are envisioned by compending Application No. 10/673,021's claims 1-48 in that claims 1-52 of the compending application contain all the limitations of claims 1-7, 16-22, 31-37 and 46-52 of the instant application therefore are not patently distinct from the compending application claims and as such are unpatentable for obvious-type double patenting



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because it would have been obvious to do the obfuscation in copending application conditional to some event and/or using a table to select/permute instructions.

***Conclusion***

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. (See PTO-892).

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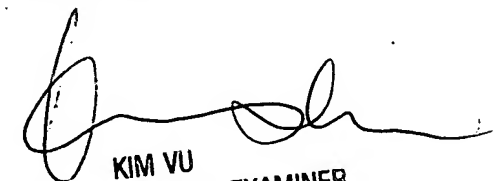
**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to April Y. Shan whose telephone number is (571) 270-1014. The examiner can normally be reached on Monday - Friday, 8:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Y. Vu can be reached on (571) 272-3859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
11 April 2007  
AYS

  
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